

## A NEW NEMACHEILINE FISH OF THE GENUS *SCHISTURA* McCLELLAND (CYPRINIFORMES: BALITORIDAE) FROM MANIPUR, INDIA<sup>1</sup>

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<sup>1</sup>Accepted December, 2002

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A new nemacheiline fish species, *Schistura tigrinum* is described here from the Barak river (Brahmaputra drainage) of Manipur, India. The species is characterised by 18-30 dark brown transverse bars on the body, irregularly arranged, often fused at different points, width of each equals pale white interspaces, moderately high adipose crest on dorsal and ventral sides of caudal peduncle, a long head (26.1-27.9% of standard length), dorsal fin with 8½ branched rays and an incomplete lateral line.

**Key words:** new nemacheiline fish, genus *Schistura*, Manipur

### INTRODUCTION

Manipur state, in the extreme northeastern part of India, has numerous hill streams with a rich loach fauna. New species of the genus *Schistura* McClelland were described by Chaudhuri (1912), Hora (1921), and Tilak and Hussain (1990) from Manipur. Hora (1937) also reported the occurrence of *S. vinciguerrae* in the Namya river of the State. Vishwanath (2000) and Vishwanath and Laisram (2001) reported the occurrence of eight species of *Schistura* in the State.

The Barak river originating from Lai Leiyai area of the Senapati district of Manipur takes a southern course into the hilly terrain of the Tamenglong district, and then into Churachandpur district and Jiribam subdivision (Imphal district) to finally flow out of the State at Jirighat. The river forms a part of the Brahmaputra drainage. While making fish collections from the Khunphung area of Tamenglong district, seven specimens of *Schistura* which do not fit into the descriptions of any known species of this genus have been found. This species is described here as *Schistura tigrinum* sp. nov. Counts and measurements follow Kottelat (1990). Type specimens of the species are deposited in the Manipur University Museum of Fisheries (MUMF), Imphal, Manipur.

#### *Schistura tigrinum* sp. nov.

**Material examined: Holotype:** MUMF4105, Female, 84.5 mm SL, Barak river at Khunphung, Tamei Subdivision, Tamenglong district, Manipur, 20.xi.1999, Coll. K. Nebeshwar Sharma.

**Paratype:** MUMF 4106/7; 3 specimens, male, 83.0-84.0 mm SL; 4 specimens, female, 86.0-97.0 mm SL. Collection data same as Holotype.

**Diagnosis:** A species of *Schistura* with the following combination of characters: 18-30 dark brown transverse bars on body, irregularly arranged, often fused at different points,

width of each equals pale white interspaces, moderately high adipose crest on dorsal and ventral sides of caudal peduncle; long head (26.1-27.9% of SL), dorsal fin with 8½ branched rays; incomplete lateral line; strong processus dentiformes.

**Description:** D. iii, 8½; A. iii, 5½; C. 9+8; P.i, 10; V.i, 6. Body size large and elongate, depth increasing up to about halfway between tip of snout and caudal fin origin, almost uniform depth behind. Body section circular anteriorly, slightly compressed posteriorly. Head slightly depressed and elongate, cheeks inflated. Caudal peduncle tapered posteriorly. Moderately high adipose crest on dorsal aspect of caudal peduncle, extending up to middle of caudal fin. Pectoral fin extends up to half the length of the distance between pectoral and pelvic fin origins. Axillary pelvic lobe present; pelvic fin origin slightly behind dorsal fin origin, opposite 1<sup>st</sup> branched dorsal ray. Caudal fin deeply emarginate.

Body covered by embedded non-overlapping scales. Lateral line incomplete, extends to the level of vent or up to anal fin origin. Cephalic lateral line system with 7 supraorbital, 11+4 infraorbital, 9 operculo-mandibular and 3 supratemporal pores.

Anterior nostril pierced on the front side of a pointed flap-like tube with a very deeply notched anterior rim. Mouth arched, twice as wide as long. Upper lip with a small shallow median incision, lower lip with a deep one. Lips thick, with numerous uniform fine furrows, furrowed lobes of the lower lip slightly bigger. Strong processus dentiformes present. Inner rostral barbel reaches corner of mouth, and the outer one reaches a point vertical to the anterior margin of eye. Maxillary barbel extends beyond a point vertical to posterior rim of eye. Head longer than depth of body, its width more than half of its lateral length. Eyes moderate, situated dorsally, completely invisible from ventral side. Mouth gape wide. Tip of snout and barbels covered with minute pointed tubercles.

**Sexual dimorphism:** Suborbital flap absent in males. Males smaller and shorter, having fewer coloured vertical bars.

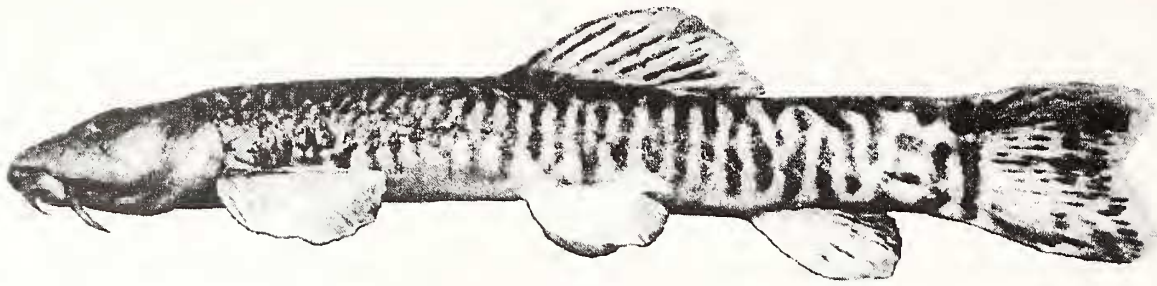


Fig. 1: *Schistura tigrinum* sp. nov. (lateral view)

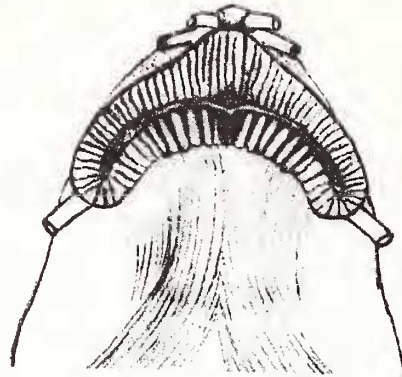


Fig. 2: Ventral view of head of *S. tigrinum* (showing structure of lips)

Table 1: Comparison of characters of *S. tigrinum*, *S. vinciguerrae* and *S. poculi*

Sl.	<i>Schistura tigrinum</i>	<i>Schistura vinciguerrae</i>	<i>Schistura poculi</i>
1.	17-30 dark brown colour bars, no blotch on back and lateral side. Bars in front of dorsal fin slightly thinner.	10-16 dark bars, 2-3 dark saddles in front of dorsal fin and 4-5 bars behind dorsal fin and the bars on each side also meet along the dorsal midline. Bars in front of dorsal fin conspicuously thinner than those behind.	15-17 dark brown bars, 11-12 dark blotches on the back. Bars conspicuously thinner than those behind dorsal fin.
2.	Bars reach ventral midline on caudal peduncle but not meeting their homologues.	Bars reach ventral midline on caudal peduncle, meet their homologues.	
3.	Dorsal fin with no black blotch at base of simple and branched rays. Dorsal fin rays stained black.	Dorsal fin with a black blotch at base of last simple and first branched ray and a second blotch behind.	Dorsal fin with a black blotch at base of last simple and first branched ray and a second blotch behind.
4.	Pelvic fin does not reach anal fin origin.	Pelvic fin reaches anus or slightly beyond the anus	Pelvic fin reaches about halfway to anal fin.
5.	Moderately high dorsal and ventral crest on caudal peduncle.	No crest on caudal peduncle	No crest on caudal peduncle.
6.	Anterior nostril pierced in front of a pointed flap-like tube with very deep notch at anterior rim.	Anterior nostril pierced in front side of a pointed flap-like tube. No notch at anterior rim.	Slightly pointed flap-like tube. No notch at anterior rim.
7.	Lips very thick, a wide median incision and a small incision on upper lip and uniformly spaced furrows on the whole area of both lips	Lips not very thick, lower lip with a median interruption and 3-5 deep furrows in the median area on each side.	Lips not very thick, lower lip with a wide incision, knob-like structure on either side of the incision, rest of it plain.

NEW DESCRIPTIONS

Table 2: Comparative morphometry of *Schistura tigrinum*, *S. vinciguerrae* and *S. poculi*

	<i>Schistura tigrinum</i>			<i>Schistura vinciguerrae</i>			<i>Schistura poculi</i>		
	In % of SL	Mean (Range) ±SD	In % of HL	In % of SL	Mean (Range) ±SD	In % of HL	In % of SL	Mean (Range) ±SD	In % of HL
Lateral head length	26.6(26.1-27.9) ±0.9			20.3(18.3-21.3) ±0.87			22.6(20.7-23.9) ±0.8		109.0(102.0-115.0) ±3.1
Dorsal head length	23.0(22.2-23.9) ±0.7			19.5(18.0-20.3) ±0.8			20.7(18.9-22.0) ±0.7		
Pre-dorsal length	53.0(52.5-53.8) ±0.6			51.4(48.9-52.6) ±1.1			53.0(49.9-55.2) ±1.1		
Pre-pelvic length	52.6(51.3-54.5) ±1.4			51.5(49.7-52.6) ±1.0			52.0(50.3-54.0) ±1.0		
Pre-anus length	74.1(72.8-75.0) ±1.0			68.8(66.8-71.3) ±0.3			70.8(68.7-73.5) ±1.2		
Pre-anal length	79.4(78.3-80.5) ±1.1			76.1(74.1-77.7) ±1.0			77.0(75.3-79.1) ±1.1		
Head depth (at eye)	11.9(10.9-13.0) ±0.9	51.8(49.3-54.5) ±2.2		9.9(8.9-10.7) ±0.5	51.0(47.0-54.0) ±1.7		10.3(9.5-11.6) ±0.6		50.0(46.0-55.0) ±2.3
Head depth (at nape)	12.5(11.9-13.3) ±0.6	54.3(53.5-55.4) ±0.9		11.9(10.7-13.0) ±0.6	61.0(57.0-65.0) ±2.5		12.0(10.8-13.6) ±0.7		58.0(54.0-65.0) ±2.8
Body depth	15.3(14.4-15.9) ±0.7	67.1(64.4-68.8) ±1.9		18.4(16.1-21.3) ±1.7	95.0(81.0-117.0) ±11.5		16.5(14.5-20.2) ±1.6		80.0(70.0-99.0) ±8.2
Caudal peduncle height	13.2(12.6-13.6) ±0.4	57.4(56.7-58.2) ±0.7		12.2(11.6-12.6) ±0.4	62.0(58.0-66.0) ±2.6		11.4(10.1-12.9) ±0.7		55.0(49.0-64.0) ±3.4
Caudal peduncle length	13.1(12.4-13.3) ±0.4	56.8(52.0-60.0) ±3.4		15.6(14.6-16.2) ±0.5	80.0(75.0-87.0) ±4.0		15.3(12.5-17.0) ±1.0		74.0(60.0-90.0) ±6.0
Snout length	12.9(12.4-13.6) ±0.5	56.2(55.7-56.9) ±0.5		8.9(8.2-9.7) ±0.4	46.0(43.0-48.0) ±1.6		9.5(7.9-11.4) ±0.8		46.0(39.0-53.0) ±3.2
Head width (at nares)	13.8(13.1-14.7) ±0.7	59.8(58.2-61.4) ±1.4		9.4(8.2-10.1) ±0.5	48.0(41.0-51.0) ±2.9		9.7(8.3-11.1) ±0.6		47.0(42.0-52.0) ±2.5
Max. head width at cheek	18.8(17.7-19.8) ±1.2	78.3(74.6-81.8) ±3.2		14.1(13.1-14.9) ±0.5	72.0(68.0-79.0) ±3.9		14.8(13.2-15.8) ±0.7		72.0(65.0-76.0) ±2.6
Body width (at dorsal fin origin)	13.0(12.6-13.5) ±0.4	56.6(53.5-58.3) ±2.1		13.7(12.3-15.3) ±1.0	70.0(61.0-82.0) ±6.8		12.2(10.6-14.1) ±1.0		59.0(49.0-69.0) ±5.2
Body width at anal fin origin	8.43(8.0-8.8) ±0.4	36.7(34.7-38.0) ±1.5		8.7(7.6-9.7) ±0.7	45.0(38.0-50.0) ±3.5		7.3(6.4-8.2) ±0.5		36.0(30.0-43.0) ±3.0
Eye diameter	3.4(3.3-3.6) ±0.1	14.7(14.0-15.1) ±0.5		4.0(3.2-4.5) ±0.4	20.0(17.0-22.0) ±1.5		3.8(3.0-4.8) ±0.4		18.0(14.0-22.0) ±2.1
Inter-orbital width	6.7(6.2-6.9) ±0.4	29.2(27.1-30.3) ±1.1		7.0(6.3-7.9) ±0.4	36.0(33.0-39.0) ±1.6		6.5(5.8-7.9) ±0.5		32.0(28.0-39.0) ±2.5
Dorsal fin height	14.2(13.9-14.7) ±0.3	61.5(59.4-63.3) ±1.8		15.2(13.2-16.6) ±1.1	78.0(70.0-85.0) ±4.7		14.1(09.6-18.3) ±1.9		68.0(47.0-88.0) ±9.2
Length of upper caudal lobe	22.8(21.1-24.1) ±1.3	98.9(95.3-104.2) ±3.9		21.8(20.6-23.1) ±0.7	111.0(105.0-117.0) ±4.1		21.3(18.8-23.4) ±1.0		103.0(88.0-116.0) ±5.5
Length of lower caudal lobe	23.4(22.3-24.9) ±1.2	101.8(99.5-107.8) ±4.0		23.4(19.9-25.3) ±1.4	120.0(106.0-128.0) ±7.2		22.2(20.5-25.2) ±1.1		107.0(99.0-124.0) ±6.3
Length of median caudal rays	17.4(17.2-17.6) ±0.2	75.8(71.8-78.1) ±2.8		16.7(14.7-18.1) ±1.2	86.0(77.0-100.0) ±7.5		15.3(12.5-18.6) ±1.6		74.0(60.0-93.0) ±8.8
Depth of anal fin	16.7(16.3-17.3) ±0.4	72.7(69.3-75.0) ±2.4		17.6(16.1-19.8) ±1.0	90.0(85.0-99.0) ±3.6		17.1(15.4-19.2) ±1.1		83.0(71.0-94.0) ±6.0
Pelvic fin length	16.8(16.2-17.8) ±0.5	73.2(71.3-75.5) ±1.7		18.7(16.9-20.7) ±1.0	96.0(89.0-102.0) ±4.8		17.3(15.7-18.6) ±0.7		84.0(77.0-91.0) ±3.7
Pectoral fin length	19.4(18.4-20.5) ±1.0	84.0(80.6-88.5) ±3.3		22.3(19.6-24.2) ±1.3	115.0(104.0-122.0) ±5.6		19.5(18.0-21.2) ±1.0		94.0(86.0-103.0) ±4.2

**Colour:** Body olivaceous grey with 18-30 dark brown vertical bars. There is great variation in the colour pattern and number of bars. The width of the bars increases from head to caudal fin base, bars as wide as the interspaces. There is gradual increase in the number of bars with increase in length. There are 29-30 vertical bars in the larger specimens (88.0-97.0 mm SL). Some bars behind the dorsal fin are regularly arranged. Most of the bars in front of the dorsal fin are divided vertically into two or three, united dorsally. Most of the vertical bars posterior to dorsal fin split into two halves, some such splits form incomplete bars. All the bars have dark edges.

In smaller specimens (83.0-84.5 mm SL), there are 17-18 bars. Some bars on the pre-dorsal area are reticulated. A distinct, vertically elongated spot on lower half of caudal base and a comparatively small spot on its upper extremity. All the bases of the simple and branched rays are black, except for a small gap between simple and first branched ray. Anal and pectoral fins have a few black rays. Dorsal surface of head and nape have reticulated bars. Last simple and all branched dorsal rays have a row of elongated black marks. Caudal fin has 3-4 irregular vertical rows of spots.

**Etymology:** The fish has been named after the tiger-like striations on the body.

**Distribution and Habitat:** Known only from the type locality, Barak River at Khunphung, Tamenglong district, Manipur. The fish inhabits the pebbly bottom of large, swift flowing streams.

**Discussion:** There is wide variation in the colour pattern and number of colour bars, i.e. 17-30 bars. The new species is very close to *S. vinciguerrae* (Hora) and *S. poculi* (Smith) in colour pattern. But it can be distinguished by its moderately

high dorsal and a small ventral crest on the caudal peduncle (absent in both *S. vinciguerrae* and *S. poculi*), anteriorly tapered shape of caudal peduncle profile and 3-4 irregular vertical coloured bands on caudal fin; longer head (26.1-27.9 vs. 18.3-21.3 and 20.7-23.9); longer head width at nares (13.1-14.7 vs. 8.2-10.1 and 8.3-11.1); wider head (17.7-19.8 vs. 13.1-14.9 and 13.2-15.8); longer snout (12.4-13.6 vs. 8.2-9.7 and 7.9-11.4) respectively of *S. vinciguerrae* and *S. poculi*. Comparison of specific morphological characters of *S. tigrinum*, *S. vinciguerrae* and *S. poculi* are given in Table 1 and a detailed one for proportional measurements in Table 2.

Smith (1945) described *S. poculi* from northern Thailand (erstwhile Siam). Kottelat (1990) reported its distribution in Salween and Mekong basins and *S. vinciguerrae* in Chindwin-Irrawaddy basin. Although Kottelat (1990) reported that sexual dimorphism was not known in *S. vinciguerrae*, Menon (1987) observed the presence of sub-orbital flap in males of the species collected from Namyra River. All the male specimens collected from Ukhrul district of Manipur (Chindwin basin) have a sub-orbital flap, and represent another species, *S. reticulata* (Vishwanath and Nebeshwar 2004).

The new species was also compared to *S. vinciguerrae* specimens in MUMF and found to have differences as follows: shallower body (14.4-15.9 vs. 16.7-17.9), longer head (26.1-27.9 vs. 18.3-21.3), longer snout (12.4-13.6 vs. 8.2-9.7), and wider head at nares (13.1-14.7 vs. 9.7-10.7).

#### ACKNOWLEDGEMENT

We are grateful to ICAR-NATP for financial assistance.

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